

ABSTRACT

Disclosed is a process for making thin hard pellicle for photomasks used in projection
5 photolithography. The process can be used for making thin hard pellicles comprising a
pellicle layer having a thickness in the range of about 5 to 120 μm and a mount frame
attached to the peripheral area of a surface of the pellicle layer. The pellicle layer can
consist essentially of a material selected from silica, fluorine doped silica, aluminum
10 doped silica, methylated silica, fluorinated and methylated silica, fluorinated aluminum
doped silica, CaF_2 , MgF_2 , BaF_2 and SiC . The mount frame is preferred to have
substantially the same CTE of the pellicle layer to minimize stress caused by temperature
change. The mount frame is preferred to be porous to the purging gas. The process for
making the hard pellicle involves deposition of an intermediate layer comprising a
hydrogenated amorphous silicon layer on a flat substrate, deposition of the pellicle layer
15 on the intermediate layer, mounting the frame to the pellicle layer and the separation of
the pellicle from the substrate by heat treatment.